

Insulin Profiles

Insulin(s)	Onset of Action	Peak Action	Duration of Action	Teaching Points	Notes
Rapid-Acting Insulin					
Lispro (<i>Humalog</i>)	≈ 15 min	0.5-2 hours	3-5 hours	Inject within 15 min of eating. injecting too early can lead to hypoglycemia	Used as correction dose insulin and to cover carbohydrate load that will be consumed Dose needs to be changed if not eating! Available in vial and pen Humalog U-200 in pen only-interchangeable one to one with U-100
Aspart (<i>NovoLog</i>)	≈ 15 min	0.5-2 hours	3-5 hours		
Aspart (<i>Fiasp</i>)	2.5 min	0.5-2 hours	3-5 hours		
Glulisine (<i>Apidra</i>)	12-24 min	0.5-2 hours	3-5 hours	Slightly quicker onset	
rDNA human powder (<i>Afrezza</i>)	12-24 min	50-60 min	2- 3 hours	Inhaled; not injected	Used as correction dose insulin and to cover carbohydrate load that will be consumed Dose needs to be changed if not eating! Not for those with respiratory issues, including COPD, smoking, etc.
Short-acting Insulin					
Regular (<i>Novolin R</i> <i>Humulin R</i>)	30-60 min	2-5 hours	5-8 hours	Inject 30-60 minutes before eating Injecting too early can lead to hypoglycemia	Most common insulin for IV use Sometimes added to TPN Preferred mealtime for patients with gastroparesis
Intermediate-Acting Insulin					
NPH (<i>Humulin N</i> <i>Novolin N</i>)	2-4 hours	4-10 hours (median: 8 hours)	10 to 16 hours	Cloudy; gently roll between palms to mix May be mixed with regular or rapid-acting insulin Draw clear insulin up first	Usually dosed once or twice daily to keep fasting blood glucose levels consistent. May need a snack to coincide with peak Often combined with rapid- or short- acting insulin
Long-acting Insulin					
Glargine (<i>Basaglar</i> <i>Lantus</i>)	1-1.5 hours	No peak Insulin delivered as steady level	20-24 hours	Do not mix in same syringe with other insulins.	When fasting, glucose is continuously released by liver to provide energy to body. Even NPO patients require basal insulin! Degludec: May be beneficial in shift works; travelers; can vary time of day as long as 8 hours between doses Lantus, Basaglar and Levemir available in pen and vial Tresiba: Pen only; U-100 and U-200 interchangeable unit for unit
Detemir (<i>Levemir</i>)	1-2 hours	Slight 6-8 hours	Up to 24 hours		
Degludec (<i>Tresiba</i>)	30-90 min	No peak	42 hours Reaches steady state in 3-4 days		

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Pre-Mixed Insulins					
Lispro protamine suspension + Lispro (Humalog Mix 75/25, Humalog Mix 50/50)	15-30 minutes	Dual 1-4 hours 6-8 hours	10-16 hours	Inject less than 15 min before eating Cloudy; gently roll between palms to mix	Usually dosed twice daily before breakfast and supper Available in pen and vial Pros: Convenience and comfort of only two injections daily Less chance of confusion/error of wrong insulin Often more economical Cons: Cannot skip or delay meals! Fixed ration; cannot adjust one part Less flexibility Humalog Mixes: vial and pen Humulin 70/30: vial and pen NovoLog Mix 70/30:vial and pen Novolin 70/30: VIAL ONLY
Aspart protamine + aspart (NovoLog Mix 70/30)	10-20 minutes	Dual 1-4 hours 6-8 hours	18-24 hours		
NPH + Regular (Humulin 50/50 Humulin 70/30 Novolin 70/30)	30-60 minutes	Dual Regular: 0.8-2 hours NPH: 6-10 hours	18-24 hours		
Concentrated Insulins with alternate profiles					
Glargine concentrated 300 units/ml (Toujeo)	6 hours	≈12 hours	≈ 24 hours	Inject once daily Do not remove from pen Cannot be mixed with other insulin	Conversion from once -daily Toujeo to once-daily Lantus: Initial dose 80% of Toujeo; adjust according to response Conversion from once-daily Lantus to once-daily Toujeo: May be substituted on equivalent unit-per-unit basis; however generally higher dose Toujeo required
Regular U-500 (Humulin R U-500)	15-30 min	4-8 hours	13-24 hours	Important to be consistent with syringe type Take 30 minutes before meals	Highly concentrated. NOT for IV use Available in vial (20 ml) and pen U-500 syringes now available Must ALWAYS verify what dose form and what syringe patient uses to ensure accurate dosing information Intended for patients on >200 units per day Dosed bid (60%-40%) or tid (40%-30%-30%)